

Amendments to the Specification:

Please replace the paragraph on page 1, lines 5-17, with the following rewritten paragraph:

This application is related to the co-pending U.S. Patent Application Serial Nos. 09/352,679~~8~~ filed July 14, 1999 now U.S. Patent 6,153,793; 09/318,840 filed May 26, 1999 now U.S. Patent 6,317,599; 09/318,841 filed May 26, 1999; 09/221,985 filed December 29, 1998 now U.S. Patent 6,442,507, and 09/318,842 filed May 26, 1999 now U.S. Patent 6,493,679; and is also related to the concurrently filed applications having U.S. Serial Nos. 09/____,____, entitled ~~“Method and System for Designing and Deploying a Communications Network which Considers Frequency Dependent Effects”~~ 09/633,121 now U.S. Patent 6,625,454; and 09/632,853 09/____,____, entitled “Method and System for Designing a Communications Network which Considers Component Attributes” and 09/633,122 09/____,____, entitled “Method and System for Designing a Communications Network which Allows the Simultaneous Selection of Multiple Components”, all of which are assigned to a common assignee, and the subject matter of these applications is incorporated herein by reference.

Please amend the paragraph beginning on page 15, at line 1, as follows:

The present invention additionally creates a new method and system for providing a way to conveniently visualize individual measurement watch points for rapid inference of meaning, as well as conveniently visualizing and rapidly inferring the meaning of differences between measurement runs collected within the same 3-D environment, using the same or different communication network designs. A measurement run is a series of measurements, usually performed by a technician or engineer within an environment (such as a city, a town, a campus, a group of buildings, or a building of interest), although such measurements may be carried out by non-technical people and may even be carried out remotely or

autonomously (e.g., by measurement devices used by a number of technicians walking through the physical environment, each being outfitted with a measurement device which randomly makes measurements and where these measurements are all shared; this being more adequately described in U.S. Serial No. 09/628,506 ~~09/____,____~~ filed July 28, 2000 entitled "System, Method and Apparatus for Portable Design, Deployment, Test and Optimization of a Communication Network, which is herein incorporated by reference).

Please amend the paragraph on page 22, at lines 16-27, as follows:

Referring now to Figure 1, there is shown a two-dimensional (2-D) simplified example of a layout 10 of a building floor plan. The method uses 3-D computer aided design (CAD) renditions of a building, or a collection of buildings, and/or surrounding terrain and foliage. However, for simplicity of illustration a 2-D figure is used. The various physical objects within the environment such as external walls, internal walls and floors are assigned appropriate physical, electrical, and aesthetic values. For example, outside walls may be given a 10dB attenuation loss, signals passing through interior walls may be assigned 3 dB attenuation loss, and windows may show a 2 dB RF penetration loss. In addition to attenuation, the obstructions are assigned other properties including reflectivity and surface roughness.

Please amend the paragraph beginning on page 22, line 28, as follows:

Figure 2 depicts the three-dimensional perspective of a building floor plan 20. Referring to Figure 2, there are several partitions within the building structure, including exterior concrete walls and interior sheetrock walls.

Please amend the paragraph on page 26, at lines 6-13, as follows:

The resulting comparison calculations may be visualized directly on the 3-

D environment database. Using variations in object shape, color, and/or height, the calculations may be visualized as shapes such as cylinders, rectangular prisms, spheres, cubes, or other objects directly in the 3-D environment database to show performance comparisons. Figure 3 depicts a comparison of performance values where cylinders 30 of varying height and color are shown in 3-D to indicate differences between predicted and measured data.

Please amend the paragraph on page 26, at lines 14-20, as follows:

Where sufficiently many data points are available, a grid of many vertices indicating varying height and/or color may be overlaid on the 3-D environmental database to indicate spatial fluctuations in performance comparisons. Figure 4 shows an environmental database 40 that has been segmented into a grid of vertices 41. Each vertex will correspond to a comparison data location. Figure 5 shows the same environmental database and overlaid grid 50 from a 3-D perspective.

Please amend the paragraph beginning on page 26, at line 21, as follows:

Once the performance comparison is complete, the designer is free to configure the display of the results. The displayed results may be presented on a display screen, printed or otherwise 3-D rendered. The range of values to display and the color and other aesthetic characteristics such as saturation, hue, brightness, line type and width, transparency, surface texture, etc., to associate with each value are selectable, or may be automatically adjusted by the system. For example, if displaying comparisons between received signal strength intensities (RSSI), the user may select to only display those portions of the region having a relative RSSI difference within the range -20 dBm to 20 dBm, and may assign specific colors to correspond to compared RSSI values within that range. For example, the user may assign the color red to represent a relative RSSI difference between -20 dBm and -10 dBm, green to represent a relative RSSI difference

between -9 dBm and 0 dBm, etc. Thus, the region is displayed as a pattern of fluctuating colors where the color assigned to each vertex within the grid corresponds to a certain value for the compared performance metric. Figure 6 depicts a 3-D comparison 60 graphically, using variations in height and color to indicate differences between communication system performance.

Please amend the paragraph on page 27, at lines 10-24 as follows:

In similar fashion, each vertex of the grid or other point in space representing a performance comparison data point is repositioned vertically in 3-D space. The elevation of each comparison data point directly corresponds to a certain value of compared performance. In the preferred embodiment of the invention, the user specifies the maximum and minimum elevation to assign to vertices, and the computer automatically scales the elevation of each comparison data point according to its compared performance value. For example, if the user selects a minimum height of 0.0 meters and a maximum height of 20.0 meters, and the compared performance values for the entire grid range from -20 dBm to 20 dBm for an RSSI difference comparison, if a given comparison data point has a value of 0 dBm it will be assigned an elevation of 10.0 meters. All elevations are specified relative to the 3-D environmental database. Figure 7 depicts a 3-D comparison 70 that has been repositioned for better viewing and analysis.

Please amend the paragraph on page 28, at lines 5-19, as follows:

The results of the performance comparison are overlaid with or superimposed on the 3-D environmental database, allowing the user to analyze the performance of the current wireless communication system design. The display can be further customized through user interaction. The designer may reorient the viewing direction and zoom factor of the display to achieve varying perspectives of the comparison results. The results may be redisplayed in a variety of forms, including 3-D wireframe with hidden lines removed, 3-D semi-transparent, 3-D

shaded or patterned, 3-D rendered, or 3-D photo-realistically rendered. The designer is free to interact with the displayed results in a variety of ways, including real-time panning and zooming to create a “fly-through” effect. Figure 8 depicts a comparison of system performance 80 where the 3-D display has been appropriately shaded for viewing and analysis purposes. Similarly, Figure 9 shows the same comparison from a different viewpoint 90. The compared performance results may be saved for later recovery and redisplay.

Please amend the paragraph beginning on page 28, at line 25, as follows:

The present invention creates a new method and system for providing a way to conveniently visualize individual measurement points for rapid inference of meaning, as well as conveniently visualizing and rapidly inferring the meaning of differences between measurement runs collected within the same 3-D environment, using the same or different communication network designs. A measurement run is a series of measurements, usually performed by a technician or engineer within an environment (such as a city, a town, a campus, a group of buildings, or a building of interest), although such measurements may be carried out by non-technical people and may even be carried out remotely or autonomously (e.g., by measurement devices used by a number of technicians walking through the physical environment, each being outfitted with a measurement device which randomly makes measurements and where these measurements are all shared; this being more adequately described in U.S. Serial No. 09/628,506 ~~09/____~~, filed July 28, 2000 entitled “System, Method and Apparatus for Portable Design, Deployment, Test and Optimization of a Communication Network, which is herein incorporated by reference).

Please amend the paragraph on page 29, beginning at line 13, as follows:

We consider measurements to have a position location tagged with each measurement, using either automatic or manual means as taught in the co-pending

application Serial Nos. 09/221,985, filed December 29, 1998. As described subsequently, the present invention performs comparisons and provides novel displays for different measurement runs, which may be a collection of measured points that are collected from a single communication network at different times of day, on perhaps different days, using the same or different frequencies, using the same or different operational modes (where different operational modes may include, but not be limited to, one or more of the following: different data transmission rates, different packet sizes, different modulation techniques, different power levels, different ~~pseudonoise~~ ~~psuedonoise~~ code sequencing, different ~~pseudonoise~~ ~~psuedonoise~~ code chip timing, different optical frequency bands, different network protocols, different bandwidths, different multiple-access techniques, different antenna distribution systems, different antenna systems, different wiring architectures, different cabling methods or system distribution methods, different physical interconnections of system components to comprise the communication system, or different source or error correction coding methods), or under different traffic loading conditions (due to bandwidth variations, user density, or some other means that causes traffic flow or capacity to change over time). Alternatively, measurement runs may be made in a particular environment where two or more different communication systems are installed to provide network connectivity within the environment. This is common when one attempts to measure two or more competitive wireless service providers within a city or campus environment, or when one wishes to compare the performance of two or more different network architectures within a particular environment.

Please amend the paragraph on page 41, at lines 7 to 28, as follows:

Referring now to Figure 14, the display of measured performance metrics at each watch point can take the form of shaded colored cylindrical markers 704 overlaid with the 3-D environmental model. Similar to Figure 13, both the height and color of the cylindrical graphical entities corresponds to the measured performance metrics at that location in the 3-D environmental model. The

designer has full control of both the range of colors and the range of heights that the cylindrical graphical entities can adopt. This form of presentation enables the designer to rapidly assess the performance of the wireless communication system by providing a much more dramatic display of the measured results. For example, with the present invention, differences between measurement runs and/or prediction runs can be easily visualized in the 3-D environment, even if some or all of the individual data points to be compared are not co-located or interpolated to approximate co-location. By having a 3-D visualization where height, width, color, shape, thickness are easily discernible between data sets, the user can quickly and visually compare results. Furthermore, the vertical display nature of the 3-D watchpoints or a collection of watchpoints that form a grid of watchpoints appear to rise above the displayed physical environment. One skilled in the art could see how the watch point graphical entities could easily assume the form of three-dimensional cones, pyramids, cubes, or any other three-dimensional graphical entity as well with similar results.